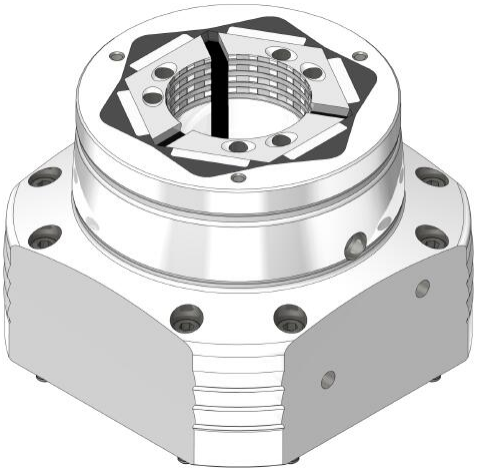
HAINBUCH
SPANNENDE TECHNIK



Installation manual

HYDROK
HYDROK 40 SE
HYDROK 32 RD
Hydraulic stationary chuck SPANNTOP

power operated

Table of contents

1 General....5
1.1 Information about this manual....5
1.2 Explanation of symbols....5
1.3 Max. RPM....6
1.4 Limitations of liability....6
1.5 Copyright....7
1.6 Scope of delivery....8
1.7 Spare parts....8
1.8 Warranty terms....8
2 Safety....9
2.1 Responsibility of the customer....9
2.2 Personnel requirements....9
2.3 Intended use....10
2.4 Personal protective equipment....11
2.5 Special dangers....12
2.6 Clamping force....15
2.7 Screws....16
2.8 Functionality....16
2.9 Environmental protection....17
3 Technical data....18
3.1 General information HYDROK....18
3.2 General information stationary chuck....19
3.3 Operating conditions....20
3.4 Power specifications....20
3.5 Dimensional sheet....20
3.6 Type designation....20
4 Structure and function....21
4.1 Overview HYDROK....21
4.2 Overview HYDROK 32 RD / HYDROK 40 SE....22
4.3 Brief description HYDROK / HYDROK32....23
4.4 Overview and brief description....24
4.5 Brief description hydraulic stationary chuck SPANNTOP....25
4.6 Designs hydraulic stationary chuck SPANNTOP....26
4.6.1 Type 100x....26
4.6.2 Type 200x....26
4.7 Optional Accessories....26
4.7.1 Changing fixture....27

4.7.2 Clamping head....27
4.7.3 Grease....27
4.7.4 Grease gun....27
4.7.5 Tandem cylinder....28
4.7.6 Hydraulic base plate....28
4.7.7 Multiple clamping pallet....29

5 Transporting, packaging and storing....30
5.1 Safety instructions for transporting....30
5.2 Symbols on the packaging....30
5.3 Transport inspection....30
5.4 Unpacking and inner-company transportation....31
5.5 Packaging....32
5.6 Storing....33

6 Assembly....34
6.1 Preparations....34
6.2 Installation....34
6.2.1 Installation of the HYDROK and the hydraulic stationary chuck SPANNTOP....35
6.2.2 Installation of the HYDROK 32 RD and the HYDROK 40 SE....37
6.2.3 Installation of the clamping head....38
6.3 Inspections....39
6.4 Control of the stroke position....40
6.5 Activities after production is concluded....40

7 Disassembly, subsequent storage, disposal....41
7.1 Safety....41
7.2 Disassembly of the clamping device....42
7.2.1 Disassembly of the clamping head....42
7.2.2 Disassembly of the HYDROK....42
7.2.3 Disassembly of the HYDROK 32 RD / HYDROK 40 SE....43
7.2.4 Disassembly of the hydraulic stationary chuck SPANNTOP....44
7.3 Subsequent storage of the clamping device....45
7.4 Disposal....45

8 Maintenance....46
8.1 Cleaning....46
8.1.1 Cleaning stationary chuck and HYDROK....46
8.1.2 Cleaning HYDROK 32 RD and HYDROK 40 SE....47
8.2 Preservation....48
8.3 Maintenance schedule....49
8.4 Bolt torque....50

9 Trouble shooting.....51
9.1 Safety.....51
9.2 Trouble shooting table.....52
9.3 Start-up after corrected fault.....53
10 Appendix.....54
10.1 Service Hotline.....54
10.2 Representatives.....54
10.2.1 Germany.....55
10.2.2 Europe.....56
10.2.3 America.....59
11 Index.....60

»Translation of **original installation manual**«

1 General

1.1 Information about this manual

This manual enables safe and efficient handling of the clamping device.

The manual is a component of the clamping device and must be kept in the immediate vicinity of the clamping device where it is accessible for personnel at all times. Personnel must have carefully read and understood this manual prior to starting all tasks. The basic prerequisite for safe work is compliance with all the safety instructions and handling instructions in this manual.

Illustrations in this manual are provided for a basic understanding and may deviate from the actual model of the clamping device.

It is assumed that the reader is familiar with standard procedures, such as cleaning the mounting surfaces.

1.2 Explanation of symbols

Safety instructions

Safety instructions are indicated by symbols in this operating manual. The safety instructions are introduced by signal words that express the scope of the hazard.

The safety instructions must be strictly adhered to, you must act prudently to prevent accidents, personal injury, and material damage.

DANGER!

… indicates an imminent dangerous situation than can result in death or serious injury if it is not avoided.

WARNING!

… indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.

CAUTION!

… indicates a possible dangerous situation that can result in minor or light injury if it es not avoided.

NOTE!

… indicates a possible dangerous situation that can result in material damage if it is not avoided.

Tips and recommendations

… indicates useful tips and recommendations, as well as information for efficient and trouble-free operation.

1.3 Max. RPM

CAUTION!

The maximum permissible RPM of the clamping device must be redetermined in every application case, on the basis of the clamping forces required for machining.

Of all RPMs of the groups specified, the **lowest given RPM** must always be used.

1.4 Limitations of liability

All information and instructions in this operating manual have been provided under due consideration of applicable standards and regulations, the current state of technology, as well as our many years of experience.

The manufacturer assumes no liability for damage due to:

- Failure to follow the instructions in the manual
- Non-intended use
- Deployment of untrained personnel
- Unauthorized conversions
- Technical changes
- Use of non-approved spare parts

The actual scope of delivery can vary from the explanations and graphic representations provided in this manual in the case of special versions, if supplemental order op-

tions are desired, or on the basis of the latest technical changes.

The agreed obligations in the delivery contract, the general terms and conditions, as well as delivery conditions of the manufacturer, and the statutory regulations valid at the time the contract was concluded, apply.

CAUTION!

Our clamping devices are balanced with balance quality G = 4, in one level n = 1.

The data on the rotation balance refers to rotationally symmetrical work pieces.

The clamping of not rotationally symmetrical work pieces may not be clamped and/or only be clamped after consultation with the manufacturer.

Balancing bolts and balancing weights at the clamping devices may not be removed / disassembled!

1.5 Copyright

This manual is protected by copyright and is provided exclusively for internal purposes.

Delivery of the operating manual to third parties, duplication in any form – including excerpts – as well as exploitation and/or communication of the content, are not permitted [except for internal use] without written approval from the manufacturer.

Actions to the contrary make damage compensation mandatory. We reserve the right to enforce additional claims.

1.6 Scope of delivery

All tools and accessories that are not included in the scope of delivery are marked as optional.

In scope of delivery of the clamping device:

- 1 HYDROK

Optionally the scope of delivery of the clamping device HYDROK includes:

- 2 Koenig expander
- Clamping head
- Multiple clamping pallet [only for size 65]

Optionally the scope of delivery of the clamping device HYDROK 32 includes:

- Clamping head
- Tandem cylinder
- Hydraulic base plate

1.7 Spare parts

WARNING!

Safety risk if the wrong spare parts are used!

Incorrect or defective spare parts can cause damage, malfunction, or total failure; they can also impair safety.

- Only use manufacturer's original spare parts.

Only purchase spare parts from authorized dealers or direct from the manufacturer. Addresses are in the appendix.

1.8 Warranty terms

The warranty terms are included in the manufacturer's terms and conditions.

2 Safety

This section provides an overview o fall the important safety aspects for optimal protection of personnel, as well es for safe and trouble-free operation.

2.1 Responsibility of the customer

The device is used in industrial applications. Consequently the owner of the device is subject to legal industrial safety obligations.

In addition to the safety instruction in this manual, generally valid safety and accident protection guidelines, and environmental protection guidelines must be adhered to and complied with for the area of implementation of the device.

2.2 Personnel requirements

WARNING!

Danger of injury due to insufficient qualification!

Improper handling of the clamping device can cause serious injury or material damage.

- Only have activities performed by personnel who are qualified to perform these activities.

The following qualifications are cited in the operating manual for the various activity areas.

- Specialized personnel
  are personnel who due to their specialized training, skills, and experience, as well as knowledge of the applicable regulations, are capable of executing the tasks assigned to them and of recognizing and avoiding possible hazards on their own.
- Hydraulic specialist
  The hydraulic specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations. Due to his spe-

cialized training and experience the hydraulic specialist can perform tasks on hydraulic equipment and recognize and avoid possible dangers on his own.

- **Electric specialist**
  The electric specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations.
  Due to his specialized training and experience the electric specialist can perform tasks on electric equipment and recognize and avoid possible dangers on his own.

Only persons from whom it can be expected that they reliably execute their work are considered as personnel. Persons whose capability to react is impaired, for instance through drugs, alcohol, or medication, are not approved.

- Comply with age-specific and job-specific regulations that are applicable at the installation site when selecting personnel.

2.3 Intended use

The clamping device is designed for installation on a machine table.

The clamping device should only be mounted, operated, maintained, and cleaned by instructed, specialized personnel.

Intended use also includes compliance with all the instructions in this manual.

Any use that extends beyond the intended use, or any other use of the clamping device is considered to be misuse and can cause dangerous situations.

WARNING!

Danger due to misuse!

Misuse of the clamping device can cause dangerous situations.

Particularly refrain from the following uses of the clamping device:

- Use in machines.
- Use in turning machining.
- Use with technical data other than that specified on the clamping device.

Claims of any type due to damage arising from non-intended use are excluded.

2.4 Personal protective equipment

Wearing of personal protective equipment is required to minimize health hazards when working with the device.

- Always wear the protective equipment necessary for the respective task when working with the device.
- Follow the instructions that have been posted in the work area.

Always wear

For all tasks always wear:

Protective work clothing

is tight-fitting work clothing with low resistance to tearing, with tight sleeves, and without projecting parts. It is primarily used to protect against entanglement by moving machine parts.

Do not wear rings, chains, or other jewelry.

Safety footwear

for protection against heavy falling parts and slipping on slippery substrates.

For special tasks wear

Special protective equipment is required when executing special tasks. Separate reference is made to this equipment in the specific sections of this manual. This special protective equipment is explained below:

Hard hat

to protect against falling and flying parts and materials.

Protective goggles

to protect eyes from flying parts and liquid splashes.

Protective gloves

to protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.

2.5 Special dangers

In the following section residual risks are cited that occur due to installation of the clamping device in a machine tool. In each case the residual risks that have been determined based on a risk analysis of the machine must be specified by the customer.

- Follow the safety instructions listed here and the warnings in the other sections of this manual to reduce health hazards and to avoid dangerous situations.

Suspended loads

WARNING!

Life-threatening danger due to suspended loads!

Some clamping devices must be lifted with a crane. When lifting the clamping device there is a life-threatening hazard due to falling parts or parts swinging out of control.

- Never step under suspended loads.
- Comply with the instructions concerning the intended attachment points. Ensure that the sling gear is securely seated!
- Do not attach lifting gear in projecting components.
- Only use approved hoists and sling gear with sufficient bearing capacity.
- Do not use rope and belts that are torn or frayed.

Moving parts

WARNING!

Danger of injury due to moving parts!

Rotating parts of the clamping device can cause serious injuries.

- Do not reach into moving parts or handle moving parts during operation.
- Do not open covers when the device is in operation.
- Be aware of afterrun time:
  Prior to opening the covers ensure that all parts have come to a standstill.
- Wear tight-fitting protective work clothing in the danger zone.

Wrong clamping of the work piece

WARNING!

Danger of injury due to incorrect clamping of the work piece!

Incorrect work piece clamping may lead to the ejection of the work piece and result in serious injuries.

Too low supply pressure can lead to the reduction of clamping force!

Too high supply pressure can lead to damage of the components of the clamping device!

- Check and adjust, if necessary, the supply pressure regularly.
- Do random checks of the unmachined work pieces on dimensional accuracy.

Missing changing parts

WARNING!

Danger of injury due to missing changing parts!

When operating the clamping device without changing parts [segmented clamping bushing, clamping heads, work piece end-stops] there is a higher danger of crushing injuries due to the stroke of movable components of the clamping device.

- The clamping process may not be initiated without assembled segmented clamping bushing and/or work piece end-stop.

Parts with sharp edges

WARNING!

Risk of injury!

When screwing of individual components such as work piece end-stop, threaded adapter or similar components, which are equipped with an external thread or have a ridge formed by wear, cuts may occur during the assembly!

- The operation must be carried out only by qualified personnel.
- Wearing gloves / [PSA] is required!

2.6 Clamping force

The achieved clamping force can vary due to the maintenance condition of the clamping device [state of lubrication and degree of contamination] [see chapter »Maintenance«].

The clamping force must be checked at regular intervals. This requires the use of static clamping force measuring devices.

CAUTION!

Damages due to excessive draw and compressive force!

An excessive draw force and/or compressive force may damage the clamping device.

- The max. draw force and compressive force may not be exceeded.

2.7 Screws

Moving parts

WARNING!

Danger of injury due to screws and stud screws being accelerated out of the device!!

Screws and stud screws radially attached to the product can be accelerated out of the device and cause severe injuries.

- At the product radially mounted screws and stud screws which were loosened for assembly and maintenance must be re-tightened with the correct tightening torque!
- The tightening torque is shown in the assembly drawing of the product or it is engraved on the device itself in the direct vicinity of the screw or stud screw.
- All screws or stud screws that are not marked with a tightening torque specification are tightened with the prescribed tightening torque and locked [medium-strength bonding] in the factory and should only be unscrewed after consultation with the manufacturer. If in doubt you must contact the manufacturer immediately do determine the subsequent procedure.

2.8 Functionality

NOTICE!

With high contamination of the clamping device the functionality is no longer guaranteed.

- The cleaning and maintenance intervals must be observed.

2.9 Environmental protection

NOTE!

Environmental hazard due to incorrect handling!

Incorrect handling of environmentally hazardous substances, particularly improper disposal, can cause significant environmental damage.

- Always comply with the instructions cited below
- If environmentally harmful substances should inadvertently get into the environment, initiate suitable measures immediately. If in doubt notify the responsible municipal authority about the damage.

The following environmentally harmful substances are used:

Lubricants

Lubricants like greases and oils can contain toxic substances. Ensure that they do not get into the environment.

The device must be disposed of by a specialized disposal company.

To achieve trouble-free operational performance of the clamping device only use HAINBUCH lubricants. See the appendix for reference addresses.

3 Technical data

3.1 General information HYDROK

Variant	Size	Weight [kg]	Dimension [L x w x h in mm]	Clamping force $F_{rad.}$ max. [kN]	Actuating pressure max. [bar]
RD	32	2,7	79,8 x 79,8 x 95	70	100
	42	12,3	154 x 154 x 120	80	40
	52	12	154 x 154 x 120	94	46
	65	16,4	174 x 174 x 130	105	40
	80	17,5	186 x 186 x 130	115	40
	100	30,9	229 x 229 x 140	150	40
SE	40	2,7	79,8 x 79,8 x 95	85 [70]	85
	52	11,8	154 x 154 x 120	108 [94]	46
	65	16,3	174 x 174 x 130	120 [105]	40
	100	30,4	229 x 229 x 140	172 [150]	40

F_{rad} max. can only be reached in lubricated condition.
In unlubricated condition F_{rad} max. is much lower.

3.2 General information stationary chuck

Variant	Size	Weight [kg]	Dimension [ø x h in mm] [L x w x h in mm]	Connection [ø h4 x height in mm]	Clamping force $F_{rad.}$ max. [kN]	Actuating pressure max. [bar]
Stationary chuck SPANNTOP RD	32	12,3	Ø 152 x 118	Ø 148 x 8	70	40
	42	12,3	Ø 175 x 120	Ø 170 x 8	80	40
	65	16,4	Ø 200 x 140	Ø 196 x 8	105	40
	80	17,5	Ø 215 x 140	Ø 210 x 8	115	40
	100	30,9	Ø 232 x 138	Ø 228 x 8	150	40
Stationary chuck SPANNTOP SE	32	12,3	134 x 134 x 118	Ø 148 x 8	70	40
	42	12,3	154 x 154 x 120	Ø 170 x 8	80	40
	65	16,4	174 x 174 x 140	Ø 196 x 8	105	40
	80	17,5	186 x 186 x 140	Ø 210 x 8	115	40
	100	30,9	210 x 210 x 138	Ø 228 x 8	150	40

F_{rad} max. can only be reached in lubricated condition.
In unlubricated condition F_{rad} max. is much lower.

3.3 Operating conditions

Environment	Specification	Value	Unit
	Temperature range	15 - 65	°C

3.4 Power specifications

NOTE!

Material damage if the power specifications do not agree!

If the power specifications of clamping device, machine adapter and machine do not agree, severe damage extending to total damage can occur.

- Only operate clamping devices and adapters in machines with the same power specifications.

Information on maximum clamping force and drawtube force is provided on the clamping device and the adapter.

3.5 Dimensional sheet

Dimension sheets for the respective product can be requested from HAINBUCH.

3.6 Type designation

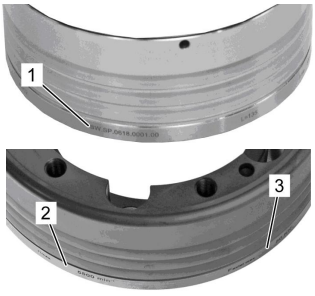


Fig. 1

The type designation is on the product and includes the following information:

1 ID no. [marked with the # symbol]

2 Maximum speed [rpm]

3 Maximum clamping force [kN]

4 Structure and function

4.1 Overview HYDROK

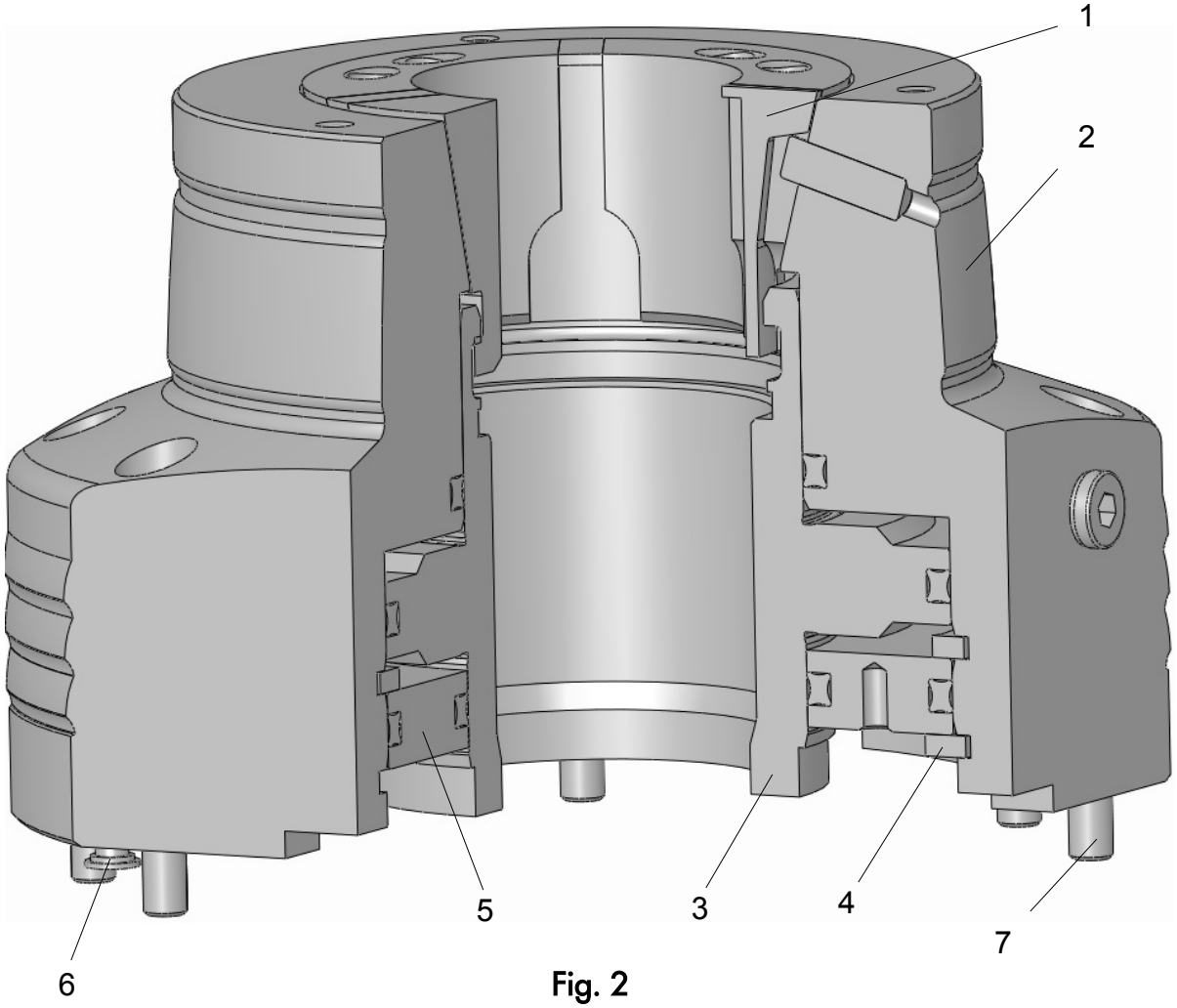


Fig. 2

1. Clamping head [optional]
2. Housing
3. Piston / coupling
4. Locking ring
5. Cylinder cover
6. Fitting
7. Mounting screws

4.2 Overview HYDROK 32 RD / HYDROK 40 SE

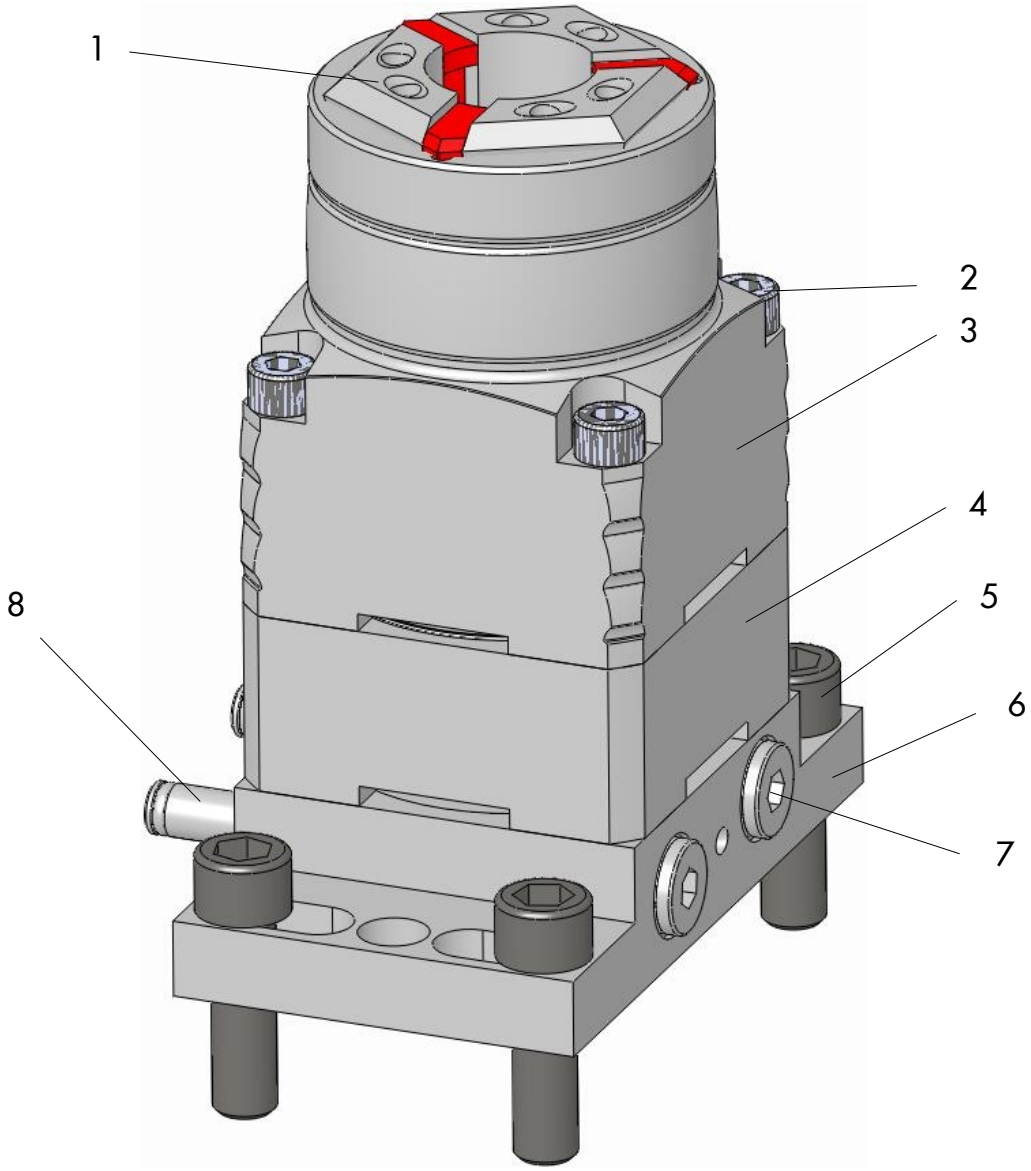


Fig. 3

1. Clamping head [optional]
2. Mounting screws [4x]
3. HYDROK 32
4. Tandem cylinder [optional]
5. Allen screws [4x]
6. Hydraulic base plate [optional]
7. Hydraulic connection
8. Hydraulic connection [optional] for the connection of several HYDROK 32

4.3 Brief description HYDROK / HYDROK32

The HYDROK is ideal for stationary use: eg in drilling and machining centers and milling machines.

The clamping heads consist of hardened steel segments which are vulcanized together. They guarantee parallel clamping of the workpieces as well es a fast set-up and high accuracy - during minimum deformation of the workpieces.

Due to the axial pulling components while clamping, the clamping head is pulled directly into the stationary chuck. This makes the clamping of the workpieces very stable. Additional the entire clamping device gets stiff which affects the service live of the tools favorably.

5-axis machining or rational multiple clamping, wit h the HYDROK we offer a hydraulically actuated stationary chuck that provides even more implementation possibilities. It can be used with all clamping device adaptations, such as the MANDO Adapt mandrel-in-the-clamping device or with the jaw adapter.

Consequently, allowing for future and complete reliability on the intelligent HAINBUCH modular system, even for stationary clamping devices.

Key advantages:

- Excellent price/performance ratio
- Easy set-up
- Repeatability < 0.01 mm possible
- Ideal for automated clamping
- Angular contour allows lower space requirement
- Multiple clamping made possible in the smallest space
- Ideal for 5-side machining
- Typical HAINBUCH features, such as user friendly set-up, full passage, parallel clamping, optimal power conversion, extreme rigidity and superior holding power, as well as minimal wear and tear
- Prepared for work piece end-stop and front end-stop

With the HYDROK 32 you may adjust the required pressure by the tandem cylinder.

4.4 Overview and brief description

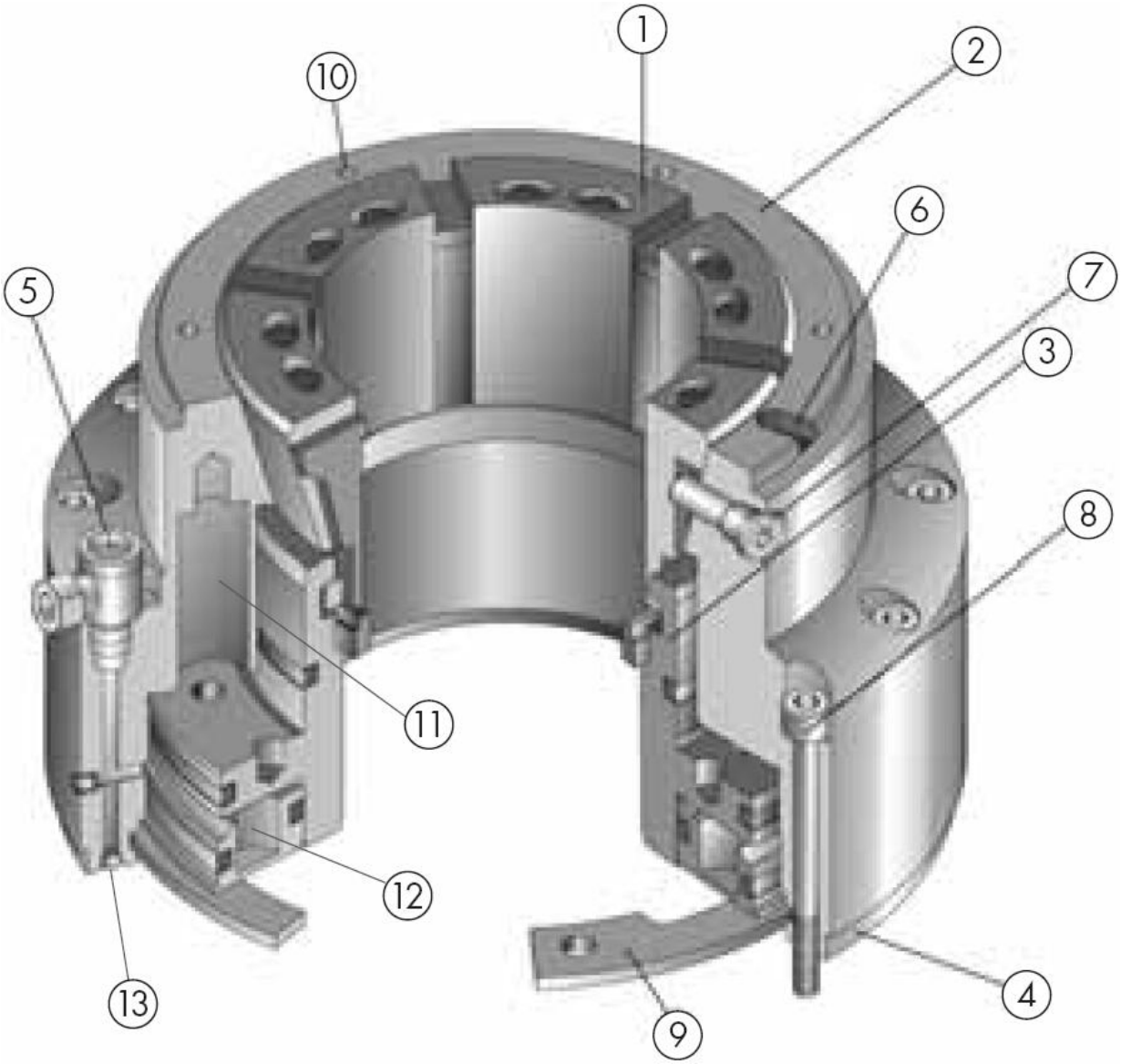


Fig. 4

9. Clamping head
10. Housing
11. Piston
12. Connection to base plate or table
13. Media supply (from side or through the base plate]
14. Positioning for front end-stop
15. Radial positioning
16. Mounting screws
17. Safety ring
18. Mounting thread for frond connection
19. Disc springs [only type 2000]
20. Disc springs [only type 3000]
21. O-rings

4.5 Brief description hydraulic stationary chuck SPANNTOP

The HYDROK is ideal for stationary use: e.g. in drilling and machining centers and milling machines.

The clamping heads consist of hardened steel segments which are vulcanized together. They guarantee parallel clamping of the workpieces as well es a fast set-up and high accuracy - during minimum deformation of the workpieces.

Due to the axial pulling components while clamping, the clamping head is pulled directly into the stationary chuck. This makes the clamping of the workpieces very stable. Additional the entire clamping device gets stiff which affects the service live of the tools favorably.

5-axis machining or rational multiple clamping, wit h the HYDROK we offer a hydraulically actuated stationary chuck that provides even more implementation possibilities. It can be used with all clamping device adaptations, such as the MANDO Adapt mandrel-in-the-clamping device or with the jaw adapter.

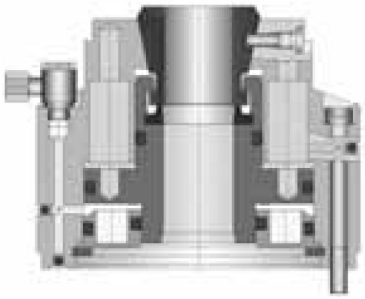
Consequently, allowing for future and complete reliability on the intelligent HAINBUCH modular system, even for stationary clamping devices.

Key advantages:

- Repeatability < 0.01 mm possible
- Ideal for automated clamping
- Angular contour allows lower space requirement
- Ideal for 5-side machining
- Typical HAINBUCH features, such as user friendly set-up, full passage, parallel clamping, optimal power conversion, extreme rigidity and superior holding power, as well as minimal wear and tear
- Prepared for work piece end-stop and front end-stop
- Clamping possibly by spring assemblies.

4.6 Designs hydraulic stationary chuck SPANNTOP

4.6.1 Type 100x



Clamping By spring assemblies

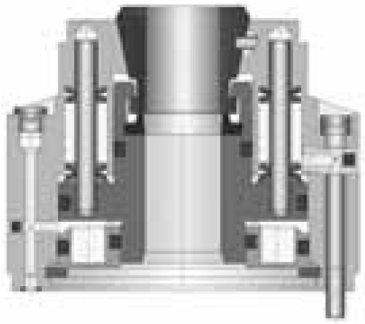
Loosening Hydraulic

Hydraulic connection through the base plate.

The spring force of the disc springs is getting lower if the stationary chuck moves into reserve stroke.

Fig. 5

4.6.2 Type 200x



Clamping By spring assemblies

Loosening Hydraulic

Fig. 6

4.7 Optional Accessories

The accessories described here are not included in the scope of delivery.

Specially developed segmented clamping bushings match to the respective maximum RPM are available for each clamping device. Trouble-free and precise function of HAINBUCH clamping devices is only ensured when using original HAINBUCH segmented clamping bushings.

Lubricating grease and grease gun are required for cleaning and preservation of the clamping device. The lubricating grease is also specially matched for protection of the vulcanized segments of the segmented clamping bushings and increase their service life and elasticity by a significant factor.

4.7.1 Changing fixture

Fig. 7

Manual changing fixture

The pins of the changing fixture are inserted in the matching holes in the clamping head. The changing fixture is tensioned via hand force. The clamping head is firmly clamped in the changing fixture and can be inserted into the mounted clamping device with the aid of the changing fixture.

Fig. 8

Pneumatic changing fixture

The pins of the changing fixture are inserted in the matching holes in the clamping head. The changing fixture is tensioned via compressed air. The clamping head is firmly clamped in the changing fixture and can be inserted into the mounted clamping device with the aid of the changing fixture.

4.7.2 Clamping head

Fig. 9

The clamping heads are used to accommodate the work piece that will be machined. They consists of hard steel and rubber segments that are connected via a vulcanizing process.

Depending on the requirements of the work piece there are clamping heads in different sizes and with different profiles and bores.

4.7.3 Grease

Fig. 10

The universal grease for chuck and mandrel lubrication is supplied in a 1000g can. The order number for the universal grease is 2085/0003; it can be ordered from HAINBUCH.

4.7.4 Grease gun

Fig. 11

The grease gun is filled with universal grease, which is pressed into the clamping device. The grease gun has a pointed mouthpiece. The order number for the grease gun is 2086/0004; it can be ordered from HAINBUCH.

4.7.5 Tandem cylinder

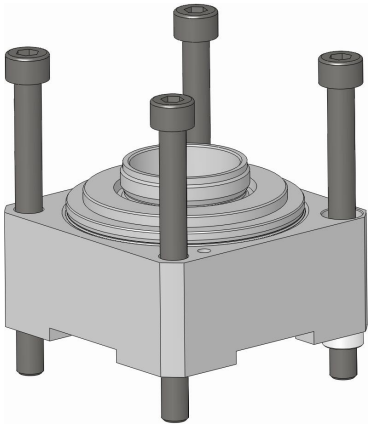


Fig. 12

By adapting the tandem cylinder to the HYDROK 32 you can reach a clamping pressure of 70 kN by only 50 bar.

The tandem cylinder has the order number 10510/0001 and can be ordered from HAINBUCH.

4.7.6 Hydraulic base plate

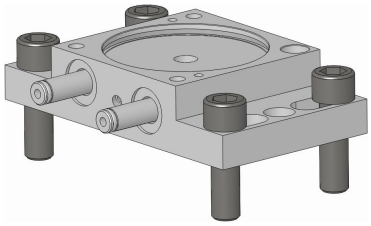


Fig. 13

For size 43 RD a special hydraulic base plate has been developed.

- The hydraulic base plate is pressure checked at 10MPa [100bar].
- Connecting material is in scope of delivery
- Mounting of the hydraulic base plate by clamping edge.

The hydraulic base plate can be ordered separately:

	Dimensions (L x W x H)	Order number
Hydraulic base plate ■ HYDROK size 32 RD ■ HYDROK size 40 SE	140 x 79,8 x 30	1205/0006

WARNING!

Risk of injury due to uncontrolled movement of the hydraulic connection!

When connecting the hydraulic with a HAINBUCH base plate or a self-constructed base plate and the use of rapid action coupling an automatic movement may occur. This can result in serious injury.

- Connect the rapid action coupling only with extreme vigilance.

4.7.7 Multiple clamping pallet

Fig. 14

For size 65 a special multiple clamping pallet has been developed.

- Connecting material is in scope of delivery
- Mounting of the hydraulic base plate by clamping edge.

The multiple clamping pallet is available in several models and can be ordered separately:

Multiple clamping pallet for HYDROK size 65	Dimensions (L x W x H)	Order number
2 times	360 x 180 x 35	1205/0001
4 times - serie	720 x 180 x 35	1205/0002
4 times - square	360 x 360 x 35	1205/0003

5 Transporting, packaging and storing

5.1 Safety instructions for transporting

Unbalanced package

WARNING!

Danger of falling due to an unbalanced package

Packed goods can have an unbalanced package. If attached incorrectly the package can tip and cause life-threatening injuries.

- Note the markings on the packages.
- Attach the crane hook in such a manner that it is located above the center of gravity.
- Carefully lift and see if the load tilts. If necessary change the attachment.

5.2 Symbols on the packaging

Fragile

Identifies packages with fragile or sensitive contents.

Handle the packed goods with care; do not allow them to fall, and do not subject them to impact.

Protect from moisture

Keep packed goods dry and protected against moisture.

5.3 Transport inspection

Check delivery immediately upon receipt to ensure that delivery is complete and to identify any transport damage.

Proceed as follows it there is apparent external damage:

- Do not accept the delivery, or only accept it with reservation.
- Note the extend of transport damage on the transport documents or on the transport company's delivery ticket.
- Submit a complaint.

Report any defect as soon as it is detected. Claims for damage compensation can only be enforced during the applicable periods for giving notice of lack of conformity.

5.4 Unpacking and inner-company transportation

The clamping device is packed vertically and has threaded bores in the end face.

To safely lift the clamping device out of the package it must be hooked into a crane depending on the weight.

For transporting with transport trolley the clamping device must be positioned in standing condition. Make sure that a non-slip pad has been laid.

All tools and optional accessories which are not in scope of delivery, are marked as optional in the installation manual

- Two people are required for this task.
- Special tools required:
  - Crane from weight more than 15 kg
  - Lifting eye bolt

Fig. 15

1. Screw lifting eye bolts into the thread in the end face of the clamping device.
2. Hook the load-handling equipment into the lifting eye bolts.
3. Use a crane to carefully lift the clamping device out of the transport packaging and put it down on a stable, level substrate.

5.5 Packaging

About the packaging

Individual packages are packed according to the expected transport conditions. Environmentally-friendly materials have been used exclusively for the packaging.

Packaging should protect the specific components from transport damage, corrosion, and other damage until installation. Therefore do not destroy the packaging, remove it just before installation.

The packed goods are sealed in foil airtight and packed in cartons. See the »Technical Data« section for the specific weight of the respective sizes.

Handling packaging materials

Dispose of packaging materials in accordance with the respectively valid statutory regulations and local guidelines.

NOTE!

Improper disposal causes environmental damage!

Packaging materials are valuable raw materials and in many cases they can be reused, or they can be effectively treated and recycled.

- Dispose of packaging materials in an environmentally responsible manner.
- Comply with locally applicable disposal guidelines. If necessary commission a specialized company to dispose of packaging.

5.6 Storing

Under certain circumstances instructions for storage and subsequent storage are affixed to the packages that extend beyond the requirements cited here.

Comply with these instructions accordingly.

Storage of packages

Only store packages under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free location
- Do not expose to aggressive media
- Protect from direct sunlight
- Avoid mechanical vibration
- Storage temperature: 15 bis 35 °C
- Relative humidity: max. 60 %
- For storage periods longer than 3 months:
  - Check the general condition of all parts and the packaging at regular intervals.
  - Touch up or re-apply anti-corrosion agents as needed

Subsequent storage of the clamping device

Only re-store the clamping device under the following conditions:

- Thoroughly clean the clamping device prior to subsequent storage [see section »Cleaning«]
- Thoroughly oil and grease the clamping device. [see section »Cleaning«]
- Store the clamping device in airtight foil
- The clamping device must be stored securely in position. If this is not guaranteed, use a suitable container for the clamping device or equip the shelf with a circumferential securing edge.

6 Assembly

6.1 Preparations

The total weight of the clamping device, consisting of spindle flange and clamping unit, depends on the size and can be as much as 30-40 kg.

Depending on the weight, to safely lift the clamping device out of the package and position it in the machine it must be hooked into a crane.

WARNING!

Danger of injury due to falling components!

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.

6.2 Installation

WARNING!

Danger of injury due to unintentional startup of the tool spindle!

Unexpected start up of the tool spindle can cause severe injury.

- Prior to switching on automatic mode close all protective doors or hoods that are present on the machine tool.
- Unscrew all ring nuts from the clamping device and remove them from the interior of the machine.
- Only run the machine in set-up mode or jog mode.
- Always remove immediately all the tools and wrenches from the clamping device after use.

6.2.1 Installation of the HYDROK and the hydraulic stationary chuck SPANNTOP

Two people are required for this task.

Special tools required:

- Allen wrench
- Tool for expander
- Crane and eye bolts from weight 15 kg

Depending on the model of the stationary chuck the hydraulic connection is

- usually by the base plate or
- alternatively at the side of the stationary chuck

The stationary chuck can be centered by the outer fit or the inner fit.

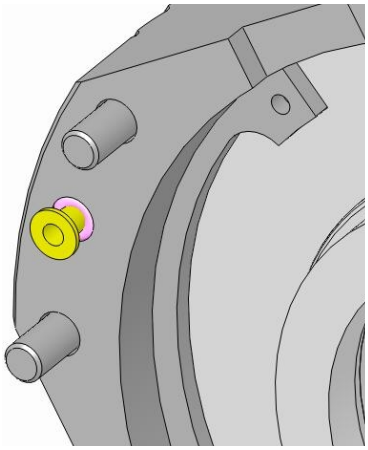


Fig. 16

Caution!

Property damage due to missing seal rings

By removing the seal rings the clamping device may become leaky.

- When remove the plug the seal ring must remain in the stationary chuck.

1. Remove the plug from the rear side of the clamping device.

Property danger due to not fitting hydraulic connections!

With not fitting of the hydraulic connections of base plate and stationary chuck the O-rings can be destroyed!

- When connecting the hydraulic by the base plate, make sure that the connectors for the hydraulic at clamping device and pipe fit.
- Please use preferably the HAINBUCH base plate [see optional accessories].

2. Connect the hydraulic preferable at the hydraulic connection at the rear side, alternatively at the hydraulic connection at the side.
3. When using the hydraulic connection at the side, insert an expander into the free lower hydraulic connection.

Clean the fitting areas at stationary chuck and machine table before each installation!

4. Put the stationary chuck on the machine table.
5. Screw in the mounting screws through the stationary chuck into the machine table and tighten them only finger tight.

Check the face run:

6. Adjust the dial indicator at the front side of the clamping element reception and/or housing and check the face run. Find the 0-position
7. Tighten the mounting screws according to the manufacturers order.

6.2.2 Installation of the HYDROK 32 RD and the HYDROK 40 SE

Two people are required for this task.

Special tools required:

- Allen wrench
- Tool for expander

The hydraulic supply of the stationary chuck is carried out via the base plate.

The stationary chuck can be centered either on an outer diameter or on an inner diameter.

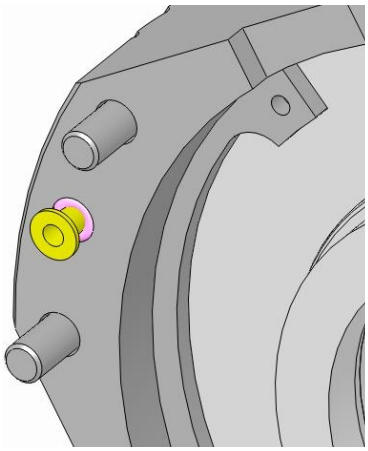


Fig. 17

Caution!

Property damage due to missing seal rings

By removing the seal rings the clamping device may become leaky.

- When remove the plug the seal ring must remain in the stationary chuck.

1. Remove the plug from the rear side of the clamping device.

Property danger due to not fitting hydraulic connections!

With not fitting of the hydraulic connections of base plate and stationary chuck the O-rings can be destroyed!

- When connecting the hydraulic by the base plate, make sure that the connectors for the hydraulic at clamping device and pipe fit.
- Please use preferably the HAINBUCH base plate [see optional accessories].

2. Connect the hydraulic preferable at the lower hydraulic connection at base plate.

When using several base plates the can be connected directly by pins!

Clean the fitting areas at stationary chuck and machine table before each installation!

3. Move the coupling of the HYDROK 32 RD / HYDROK 40 SE into clamping reserve [downwards].
4. Move the tandem cylinder in front end position.

Make sure that all o-rings are in good condition and inserted.

5. Put the tandem cylinder from the rear side on the HYDROK 32 RD / HYDROK 40 SE till end stop.

Use the „Index" holes for positioning!

6. Turn back the tandem cylinder till the "Index" holes fit.
7. Put the ring in the base plate.
8. Put the tandem cylinder together with the assembled HYDROK 32 RD / HYDROK 40 SE on the ring on the base plate.
9. Screw in the mounting screws through the HYDROK 32 RD / HYDROK 40 SE into the base plate and tighten them only finger-tight.

Check the face run:

10. Adjust the dial indicator at the front side of the clamping element reception and/or housing and check the face run. Find the 0-position
11. Tighten the mounting screws according to the manufacturers order.

6.2.3 Installation of the clamping head

The changing of the clamping head is only possible in release position of the stationary chuck.

Special tool required:

- Changing fixture

1. Clean the clamping cone in the clamping element reception as well as the housing.

Risk of crushing!

While operating the changing fixture there is crushing danger.

- Do not seize into moving parts!

2. Put the changing fixture on the clamping head: Put the pins of the changing fixture completely into the front holes in the clamping head. By operating the changing fixture the clamping head is squeezed at the coupling area.
3. Put the clamping head into the clamping element reception and/or the housing.
4. Loosen the changing fixture by light pressure in axial direction and pull it out of the clamping head.

6.3 Inspections

NOTE!

Material damage due to damaged clamping devices!

A damaged, incomplete, or unbalanced clamping device can significantly damage or even destroy the machine tool and the work piece.

- Only install undamaged, complete, and precisely balanced clamping devices.
- If in doubt contact the manufacturer.

Ensure the following points prior to each installation and start-up of the clamping device:

- All allen screws of the clamping device must be present and tightened with the proper tightening torque.
- All rubber segments must be intact; this means that they are neither torn, nor are they porous at any point.
- All edges and bearing surfaces are intact; this means that they are neither broken nor do they show any signs of wear.
- The set speed of the machine tool should not exceed the maximum permissible speed of the clamping device [stationary chucks: n=0!].

- The maximum drawtube force specified on the perimeter of the clamping device must not be exceeded.
- The clamping pressure of the machine must be sufficiently high.
- All mounting tools must be removed from the interior of the machine.
- Clamping device and work piece must be compatible – Check the clamping diameter regularly.
- The work piece must be clamped into the clamping device with sufficient work piece tension.

6.4 Control of the stroke position

WARNING!

Crushing danger from moving parts!

Crushing danger from moving parts during controlling the stroke position!

Gaps, caused while controlling the stroke position, can cause severe injury.

- Only do the controlling of the stroke position with assembled changing parts.
- Only run the machine in set-up mode or jog mode.

6.5 Activities after production is concluded

1. Move the clamping device into unclamped position.
2. Switch off the machine tool and safeguard it from being switched on again.
3. Open the protective door or hood.
4. Clean the clamping device of chips and production residues with a soft, lint-free cloth.
5. Close the protective door or hood.

7 Disassembly, subsequent storage, disposal

If there is break in production that lasts longer than 3 days, or if the machine will be changed for other work pieces, the clamping device must be disassembled and properly stored in accordance with the manufacturer's specifications [see section »Transport, packaging, storage«].

Prior to disassembling:

- Remove fuels and auxiliary materials, as well as residual processing materials and dispose of these items in an environmentally-responsible manner.

7.1 Safety

Safeguarding against restart

DANGER!

Life-threatening danger if restarted without authorization

When disassembling there is danger of the energy supply being switched on inadvertently. This poses a life-threatening hazard for persons in the danger zone.

- Prior to starting the tasks switch off all energy supplies and safeguard them from being switched on again.

WARNING!

Danger of injury due to falling components!

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

DANGER!

Risk of injury by released energy!

Risk of injury during the disassembling of the balance weight due to released energy.

- Pay attention to the safety instruction during the disassembly of the stroke limit screw.

7.2 Disassembly of the clamping device

7.2.1 Disassembly of the clamping head

The changing of the clamping head is only possible in release position of the stationary chuck.

Special tool required:

- Changing fixture

Risk of crushing!

While operating the changing fixture there is crushing danger.

- Do not seize into moving parts!

1. Put the changing fixture on the clamping head: Put the pins of the changing fixture completely into the front holes in the clamping head. By operating the changing fixture the clamping head is squeezed at the coupling area.
2. Remove the clamping head out of the clamping element reception and/or the housing.
3. Loosen the changing fixture by light pressure in axial direction and pull it out of the clamping head.
4. Clean the clamping cone in the clamping element reception and/or housing.

7.2.2 Disassembly of the HYDROK

Two people are required.

Special tools required:

- Allen wrench
- crane and eye bolts from weight 15 kg

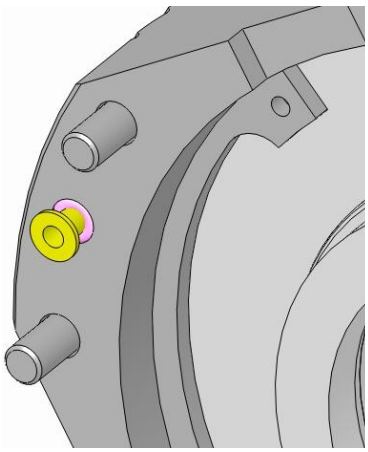


Fig. 18

1. Loosen and remove the mounting screws.
2. Disconnect the hydraulic connection at the stationary chuck.
3. Remove the stationary chuck from the machine table.

Clean the mounting surfaces of the stationary chuck and the machine table after each disassembly!

7.2.3 Disassembly of the HYDROK 32 RD / HYDROK 40 SE

Two people are required.

Special tools required:

- Allen wrench

1. Loosen and remove the mounting screws of the HYDROK 32 RD / HYDROK 40 SE.
2. Disconnect the hydraulic connection at the HYDROK 32 RD / HYDROK 40 SE.
3. Remove the HYDROK 32 RD / HYDROK 40 SE together with the tandem cylinder [optional] from the base plate.

Clean the mounting surfaces of the HYDROK 32 RD / HYDROK 40 SE, the base plate, the tandem cylinder [optional] and the machine table after each disassembly!

4. Remove the ring from the base plate and clean it.
5. Move the tandem cylinder into front end position.
6. Move the coupling of the H HYDROK 32 RD / HYDROK 40 SE into reserve stroke [downwards].
7. Unscrew the tandem cylinder downwards out of the HYDROK 32 RD / HYDROK 40 SE.

The o-rings may not be damaged!

Clean the mounting surfaces of HYDROK 32 RD / HYDROK 40 SE and the machine after each disassembly!

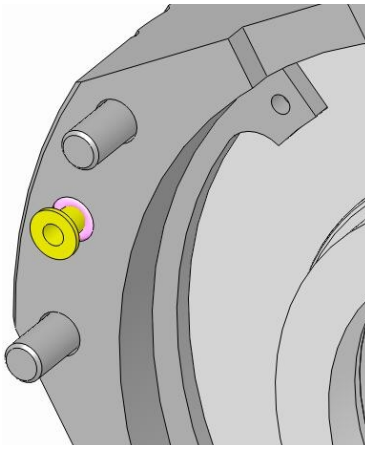


Fig. 19

CAUTION!

Material damage due to missing o-rings!

By removing the o-rings the clamping device may become leaky.

- When inserting the protection cap the o-ring must remain in the HYDROK 32 RD / HYDROK 40 SE.

8. Put the protection cap in the lower side of the clamping device.

7.2.4 Disassembly of the hydraulic stationary chuck SPANNTOP

Two people are required.

Special tools required:

- Allen wrench
- Crane and eye bolts from weight 15 kg

WARNING!

Risk of injury due to leaking hydraulic oil!

The stationary chuck may contain spring assemblies.

- Move the clamping device into reserve stroke!

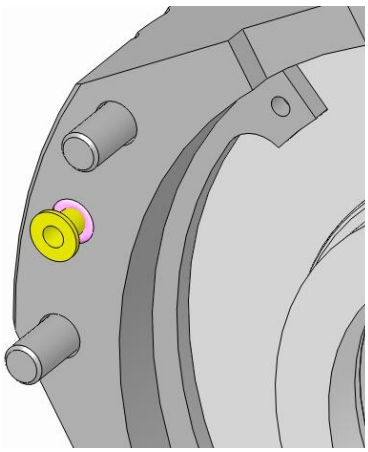


Fig. 20

1. Loosen and remove the mounting screws.
2. Disconnect the hydraulic connection at the stationary chuck.
3. Remove the stationary chuck from the machine table.

Clean the mounting surfaces of the stationary chuck and the machine table after each disassembly!

7.3 Subsequent storage of the clamping device

The clamping device must be cleaned and treated with corrosion protection for subsequent storage [see section »Cleaning«].

NOTE!

The storage conditions are specified in the section »Transport, packaging and storage«.

7.4 Disposal

If a return or disposal agreement has not been concluded, then recycle disassembled components.

NOTE!

Composite materials!

For disposal clamping devices which include composite materials [mineral cast, CFK] must be returned at HAINBUCH!

Risk of injury due to leaking fluids!

Hydraulically or pneumatically operated clamping devices may contain residues of liquids. Uncontrolled leakage of fluids can lead to severe injuries.

- Open the pressure relief screw and drain remaining liquid.
- Discard the liquid.

NOTE!

Improper disposal causes environmental damage!

Lubricants and other auxiliary materials are subject to treatment as special waste, and should only be disposed of by approved specialist companies!

Local municipal authorities or specialized disposal companies provide information on environmentally-responsible disposal.

8 Maintenance

Environmental protection

Comply with the following instructions for environmental protection when performing maintenance work:

- At all lubricating points where lubricant is applied by hand, remove escaping, used, or excess grease, and dispose of it in accordance with applicable local regulations.
- Collect used oil in suitable containers and dispose of it in accordance with applicable local regulations.

8.1 Cleaning

8.1.1 Cleaning stationary chuck and HYDROK

NOTE!

Material damage if cleaned with compressed air!

Cleaning the clamping device with compressed air can force metal chips into thread and grooves. This can damage or even destroy the clamping device.

- Never clean the clamping device with compressed air!

- Auxiliary material required:
  - Ester-free, non-polar cleaning agent
  - Soft, lint-free cloth

CAUTION!

Damage of the seal rings when partial disassembly!

When partly disassembling of the stationary chuck for cleaning / service, the seal rings will be damaged!

Keep a new set of seal rings ready for reassembling.

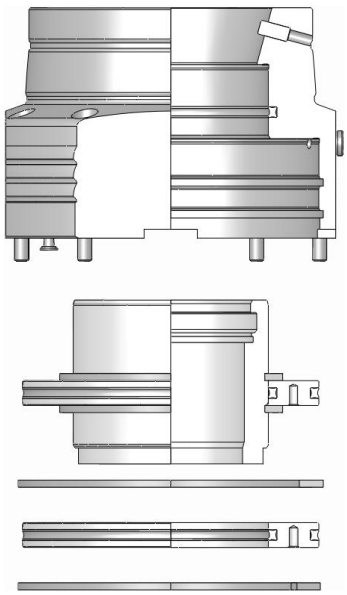


Fig. 21

1. Disassembled the clamping device [see chapter »Disassembling the clamping device«].

CAUTION!

Risk of injury due to spring tension!

While disassembling the stationary chuck for cleaning / preservation, the clamping device may cause severe injuries.

- The partly disassembly may only be done by HAINBUCH service personnel.

2. Clean all the components listed below with cleaning agent and a cloth; remove all oil and grease residues:
   - Taper reception
   - coupling area

8.1.2 Cleaning HYDROK 32 RD and HYDROK 40 SE

NOTE!

Material damage if cleaned with compressed air!

Cleaning the clamping device with compressed air can force metal chips into thread and grooves. This can damage or even destroy the clamping device.

- Never clean the clamping device with compressed air!

- Auxiliary material required:
  - Ester-free, non-polar cleaning agent
  - Soft, lint-free cloth

1. Disassembly of the HYDROK 32 RD / HYDROK 40 SE from the machine table [see chapter »Disassembly of the HYDROK 32 RD / HYDROK 40 SE«].

CAUTION!

Risk of injury by not allowed partly disassembly of the HYDROK 32 RD / HYDROK 40 SE!

When partly disassembling of the HYDROK 32 RD / HYDROK 40 SE for cleaning / service, the clamping device may be damaged or even destroyed.

- The partly disassembly may only be done by HAINBUCH service personnel.

2. Clean all the components listed below with cleaning agents and a cloth; remove all oil and grease residues:
   - Base plate
   - Tandem cylinder [optional]
   - Taper reception and coupling area of the HYDROK 32 RD / HYDROK 40 SE.

8.2 Preservation

- Special tools required:
  - Universal grease 2085/0003
  - Grease gun
  - Oil stone
  - Soft, lint-free cloth

1. Hone all the bearing surfaces of the clamping device with an oil stone
2. Lightly grease all allen screws. Remove excess grease with a cloth.
3. Lightly grease all interior and outer surfaces of the clamping device. Remove excess grease with a cloth.
4. Pack the clamping device airtight in foil. Place it on a level, impact-free storage location and safeguard it from falling.

8.3 Maintenance schedule

Maintenance tasks are described in the sections below that are required for optimal and trouble-free operation.

If increased wear is detected during regular inspections, then reduce the required maintenance intervals according to the actual indications of wear.

Contact the manufacturer, [see the service address on the back] if you have questions concerning maintenance tasks and intervals.

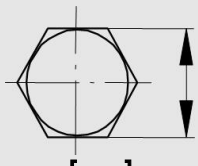
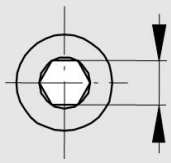
Interval	Maintenance task
Daily	Visual inspection and complete cleaning in case of heavy contamination [see section »Cleaning«]
Weekly	Clean the taper reception and coupling area [see section »Cleaning«]
Every 6 months	Completely disassemble and clean the clamping unit [see section »Cleaning«]

8.4 Bolt torque

Metric ISO thread

The guide values for bolt tightening torque for achieving the highest permissible pre-tension for metric ISO thread are specified in Nm in the table.

- Total friction coefficient μ_{tot} = 0,12
- 90% utilization of the apparent limit of elasticity

Diameter	 **[mm]**	 **[mm]**	**Torque for screw quality 10.9 [Nm]**
M 4	7	3	4
M 5	8	4	7
M 6	10	5	12
M 8	13	6	25
M 10	17	8	50
M 12	19	10	100
M 16	24	14	220
M 20	30	17	400
M 24	36	19	600

The table shows the maximum permissible values and does not include any other safety factors. Knowledge of the applicable guidelines and configuration criteria are the prerequisites.

9 Trouble shooting

Possible fault causes and the tasks to correct these faults are described in the following section.

If faults occur more frequently, the maintenance intervals must be shortened to correspond to the actual system load.

Contact the manufacturer if there are faults that cannot be corrected by following the instructions below; see the service address on the back of this operating instruction.

9.1 Safety

Trouble shooting

The following always applies:

1. For faults that pose a direct danger for personnel and or property immediately execute the emergency-stop function.
2. Determine the cause of the fault.
3. If correction of the fault requires work in the danger zone, put the machine in set-up mode.
4. Immediately inform the responsible parties at the installation site of the fault.
5. Depending on the type of fault, either have authorized specialized personnel correct the fault, or correct it yourself.

   The trouble shooting table provided below lists personnel who are authorized to correct the fault.
6. If there is a fault that was not caused by the clamping device the cause of the fault may be in the machine area. See the operating manual for the machine in this regard.

9.2 Trouble shooting table

Fault	Possible cause	Fault correction	Corrected by
Clamping head cannot be replaced	The change gap between the clamping head coupling and work piece end-stop is insufficient.	Rework the work piece end-stop	Specialist
Clamping device does not open or the release stroke is insufficient.	Fouling of the draw mechanism	Remove the clamping head and clean the coupling area [see section »Disassembling the clamping head«].	Specialist
Clamping force is too low	Work piece is under-dimensioned	Replace with a suitable clamping head	Specialist
	Insufficient hydraulic pressure on the clamping cylinder	Check the machine-side hydraulic aggregate	Hydraulic specialist
	Defective clamping cylinder or blocked drawtube	Contact the machine manufacturer	Machine manufacturer
	Seal is worn	Put in a new seal [see section »Cleaning«].	Specialist
Dimensional deviation on the work piece	Contaminated coupling area	Clean the coupling area of the clamping unit [see section »Cleaning«].	Specialist
	Contaminated clamping taper	Remove the clamping head and clean the clamping taper [see section »Cleaning«].	Specialist
Formal defect on the work piece	Elastic deformation of feedstock that is subject to formal defects. After machining, the work piece returns to its original form.	Use feedstock with fewer formal defects. Use a clamping head with several sharp teeth in the clamping surface.	Specialist
	Clamping force is too high	Reduce the clamping force to the valid level for the clamping device and the workpiece	Specialist

Fault	Possible cause	Fault correction	Corrected by
Marks on the clamping surface	Point or linear work piece clamping	Replace with a clamping head that has a smoother clamping surface	Specialist
	Wrong clamping head type	Replace the clamping head	Specialist
	Excessive dimensional difference between the work piece diameter and the clamping bore	Replace with a clamping head that has a suitable clamping bore	Specialist

9.3 Start-up after corrected fault

After correcting the fault execute the following steps to start up again:

1. Reset the emergency-stop device
2. Acknowledge the fault on the machine tool controller
3. Ensure that no one is in the danger zone
4. Start the machine tool

10 Appendix

10.1 Service Hotline

Order Hotline

Quickly ordered and delivered. A call is all it takes: +49 [0]7144. 907-333

Schedule Hotline

Current status of your order? Just call: +49 [0]7144. 907-222

24h emergency call

Has there been a crash or other technical emergency? Our experts are at your service around the clock: +49 [0]7144. 907-444

10.2 Representatives

The sales partners and service employees listed below are available for further consultation or support.

Overview of German postal codes:

J	010 – 049	C	400 – 479	O	710 – 719	H	868 – 879
M	060 – 089	A	480 – 499	D	720 – 729	D	880 – 899
J	090 – 189	C	500 – 549	L	730 – 739	E	900 – 914
I	190 – 289	N	550 – 559	M	740 – 479	L	915 – 918
B	290 – 319	C	560 – 569	F	750 – 799	E	919
A	320 – 339	K	570 – 599	H	800 – 839	G	920 – 949
B	340 – 349	N	600 – 659	G	840 – 851	E	950 – 979
N	350 – 369	F	660 – 699	H	852 – 866	M	980 – 999
B	370 – 399	L	700 – 709	L	867		

10.2.1 Germany

A Werner Bock KG
Commercial Agency
Neue Reihe 2
DE-33699 Bielefeld
Phone +49 [0]521. 92458-0
Fax +49 [0]521. 92458-99
E-mail: bockkg@gmx.de
Internet: www.werner-bock-kg.de

B Bock & Strothmann GmbH
Commercial Agency
Berliner Allee 49
DE-30855 Langenhagen
Phone +49 [0]511. 781068
Fax +49 [0]511. 782960
E-mail: vertrieb@bockundstrothmann.de
Internet: www.bockundstrothmann.de

C Jörg Fedtke
Sales Representative
HAINBUCH GMBH
Kunkelsberg 2
DE-45239 Essen
Phone +49 [0]7144. 907-661
Fax +49 [0]201. 2463-839
E-mail: joerg.fedtke@hainbuch.de

D Uwe Fischer
Sales Representative
HAINBUCH GMBH
Im Apfentäle 25
DE-72525 Münsingen-Auingen
Phone +49 [0]7144. 907-662
Fax +49 [0]7381. 183783
E-mail: uwe.fischer@hainbuch.de

E Thomas Helfer GbR
Commercial Agency
Gerwigstraße 4
DE-76437 Rastatt
Phone +49 [0]7222. 916231
Fax +49 [0]7222. 916240
Mobile +49 [0]171. 2032559
E-mail: helfer.industrievertretung@t-online.de

F Anika Hensen
Sales Representative
HAINBUCH GmbH
Erdmannhäuser Straße 57
DE-71672 Marbach
Phone +49 [0]7144. 9070
Fax +49 [0]7144. 18826
E-mail: anika.hensen@hainbuch.de

G Thomas Hummel
Sales Representative
HAINBUCH GMBH
Waldstraße 22b
DE-93197 Zeitlarn
Phone +49 [0]7144. 907-674
Fax +49 [0]7144. 907-874
E-mail: thomas.hummel@hainbuch.de

H Michael Kopp
Sales Representative
HAINBUCH GMBH
Göggінger Straße 98
DE-86199 Augsburg-Göggingen
Phone +49 [0]7144. 907672
E-mail: michael.kopp@hainbuch.de

I Künne Zerspanungstechnik
Commercial Agency
Grootkoppel 45
DE-23858 Reinfeld
Phone +49 [0]4533. 208100
Fax +49 [0]4533. 208116
Mobile +49 [0]170. 9621139
E-mail: info@kuenne-zerspanungstechnik.de
Internet: www.kuenne-zerspanungstechnik.de

J Henry Miersch
Sales Representative
HAINBUCH GMBH
Feldstraße 51
DE-06917 Jessen
Phone +49 [0]7144. 907-664
Fax +49 [0]3537. 200455
E-mail: henry.miersch@hainbuch.de

K Ulrich Remmel
Commercial Agency
Gildestraße 18
DE-58791 Werdohl
Phone +49 [0]2392. 9383-0
Fax +49 [0]2392. 9383-17
E-mail: info@remmel.de
Internet: www.remmel.de

L Renee Reuter
Sales Representative
HAINBUCH GMBH
Brühlstraße 7
DE-73252 Lenningen
Phone +49 [0]7144. 907-670
Fax +49 [0]7026. 371871
E-mail: renee.reuter@hainbuch.de

M Jörg Schlag
Sales Representative
HAINBUCH GMBH
Hopfenweg 2
DE-04420 Frankenhain
Phone +49 [0]7144. 907-665
Fax +49 [0]341. 9456468
E-mail: joerg.schlag@hainbuch.de

O Jörg Tittel
Sales Representative
HAINBUCH GMBH
Wunnensteinstraße 10
DE-71711 Steinheim/Murr
Phone +49 [0]7144. 907-668
Fax +49 [0]7144. 819864
E-mail: joerg.tittel@hainbuch.de

N Michael Simon
Sales Representative
HAINBUCH GMBH
Am Tannenberg 8
DE-63776 Mömbris
Phone +49 [0]7144. 907-667
Fax +49 [0]6029. 994932
E-mail: michael.simon@hainbuch.de

Thomas Klumpp
Technical Consultant
HAINBUCH GMBH
Hahnbergweg 15
DE-72270 Baiersbronn
Phone +49 [0]7144. 907-663
Fax +49 [0]7144. 291131
E-mail: thomas.klumpp@hainbuch.de

Carsten Zander
Technical Consultant
HAINBUCH GMBH
Friedrich-Ebert-Straße 9
DE-31848 Bad Münder
Phone +49 [0]7144. 907-669
Fax +49 [0]5042. 506751
E-mail: carsten.zander@hainbuch.de

10.2.2 Europe

Austria
GGW Gruber & Co. GmbH
Kolingasse 6
1090 Vienna
Phone +43 [0]1. 3107596-0
Fax +43 [0]1. 3107596-31
E-mail: ggw@gruber-ing.at
Internet: www.gruber-ing.at

Belgium
BIS Technics bvba/sprl
Zevenputtenstraat 20
3690 Zutendaal
Phone +32 89518890
Fax +32 89518899
E-mail: info@bistechnics.com
Internet: www.bistechnics.com

Czech Republic, Slovakia
TMC CR s.r.o.
Masná 27/9
60200 Brno
Phone +420 548214572
Fax +420 548217219
E-mail: info@tmccr.cz
Internet: www.tmccr.cz

Denmark
Jørn B. Herringe A/S
Ramsømagle
Syvvejen 31
4621 Gadstrup
Phone +45 46170000
Fax +45 46170001
E-mail: sales@jbh-tools.dk
Internet: www.jbh-tools.dk

Estonia, Latvia, Lithuania
DV-Tools OÜ
Peterburi tee 34/4
11415 Tallinn
Phone +372 6030508
Fax +372 6030508
E-mail: info@dv-tools.ee

France
HAINBUCH France SNC
Equipements de machines-outils
ZI Lons-Perrigny
1600, Route de la Lième
39570 Lons-le-Saunier
Phone +33 384876666
Fax +33 384876677
E-mail: info@hainbuch.fr
Internet: www.hainbuch.com

Great Britain
HAINBUCH UK Ltd.
6 Newmarket
Keys Business Village, Keys Park Road
Hednesford, Staffordshire
WS12 2HA
Phone +44 1543 478710
Fax +44 1543 478711
Mobile +44 7980212784
E-mail: nick.peter@hainbuch.co.uk
Internet: www.hainbuch.com

Greece
PAPET Papadopoulos GbR
Hauptstraße 75
DE-73061 Ebersbach/Fils
Phone +49 71635858/530668
Fax +49 716352265
E-mail: paris@papet-technologies.de

Ireland
Machine Shop & Engineering Supplies Ltd.
11 Vale View Lawn - The Park
Cabinteely, Dublin 18
Phone +353 12847003
Fax +353 12857955
E-mail: machshop@indigo.ie

Finland
Oy Maanterä Ab
PL 70 Keinumäenkuja 2
01510 Vantaa
Phone +358 29006130
Fax +358 290061130
E-mail: maantera@maantera.fi
Internet: www.maantera.fi

France
Representative for: Haute Savoie
Utilis France Sarl
597, Avenue du Mont Blanc
74460 Marnaz
Phone +33 450963630
Fax +33 450963793
E-mail: contact@utilis.com
Internet: www.utilis.com

Great Britain
Leader Chuck Systems Ltd.
9 Century Park
Birmingham, B9 4 NZ
Phone +44 1217714843
Fax +44 1217710966
E-mail: information@leaderchuck.com
Internet: www.leaderchuck.com

Hungary
GGW Gruber & Co. GmbH
Kolingasse 6
1090 Vienna
Phone +43 [0]1. 3107596-0
Fax +43 [0]1. 3107596-31
E-mail: ggw@gruber-ing.at
Internet: www.gruber-ing.at

Italy
HAINBUCH Italia srl
Via Caduti di Nassiriya 5
22036 Cantu [Co]
Phone +39 0313355351
Fax +39 031611570
E-mail: info@hainbuchitalia.it
Internet: www.hainbuchitalia.it

Netherlands
BIS Specials
[Brandenburg Industry Service Dongen BV]
Dreef 7
6996 BA Drempt
Phone +31 313482566
Fax +31 313482569
E-mail: info@bisspecials.com
Internet: www.bisspecials.com

Poland
BIM Sp.z.o.o.
ul. Wysogotowska 9
62081 Przezmierowo
Phone +48 616232041
Fax +48 616232040
E-mail: bim@bazafirm.pl

Russia
LLC Rosna Engineering
Melnichnaya 4
192019 St. Petersburg
Phone +812 4129213
Fax +812 4125586
E-mail: rosna@rosna.spb.ru
Internet: www.rosna.spb.ru

Sweden
HAINBUCH Svenska AB
Kemistvägen 17
18379 Täby
Phone +46 87327550
Fax +46 87327650
E-mail: hainbuch@hainbuch.se
Internet: www.hainbuch.com

Turkey
Hidkom
Organize Sanayi Bölgesi
75. Yil CD. Demirciler Sit. B Blok No.2
16159 Nilüfer / Bursa
Phone +90 2242438292
Fax +90 2242436365
E-mail: hidkom@tr.net
Internet: www.hidkom.com

Norway
Onstad Maskin A/S
Chr. H. Blomsgt. 13
3717 Skien
Phone +47 35532373/74
Fax +47 35532375
E-mail: postmaster@onstadmaskin.no
Internet: www.onstadmaskin.no

Romania
Banatech srl
Carasului Str. 26
325400 Caransebes
Phone +40 255517175
Fax +40 355814125
Mobile +40 749220553
E-mail: office@banatech.ro
Internet: www.banatech.ro

Spain
ATM Asistentes Tecnologicos del
Mecanizado, S. L.
Isaac Albeniz, 29
08402 Granollers [Barcelona]
Phone +34 938606572
Fax +34 938791689
E-mail: atm.sl@atmbarcelona.com

Switzerland
Utilis Müllheim AG
Präzisionswerkzeuge
Kreuzlinger Strasse 22
CH-8555 Müllheim
Phone +41 [0]52. 7626262
Fax +41 [0]52. 7626200
E-mail: info@utilis.com
Internet: www.utilis.com

10.2.3 America

United States

HAINBUCH America Corp.
Workholding Technology
W129 N10980 Washington Dr.
Germantown, WI 53022
Phone +1 4143589550
Fax +1 4143589560
E-mail: sales@hainbuchamerica.com
Internet: www.hainbuch.com

11 Index

A

Accessories.....
- Hydraulic base plate.....28
- optional.....26

B

Bolt torque.....50

4.4Brief description.....24
- Hydraulic stationary chuck SPANNTOP 25
- HYDROK / HYDROK32.....23

C

Changing fixture.....
- Manual.....27
- pneumatic.....27

Clamping head.....27

Cleaning.....
- HYDROK 32 RD and HYDROK 40 SE 47
- Stationary chuck and HYDROK.....46

Control of the stroke position.....40

D

Dimensional sheet.....20

Disassembly.....41
- Clamping head.....42
- Hydraulic stationary chuck SPANNTOP 44
- HYDROK.....42
- HYDROK 32 RD / HYDROK 40 SE...43

Disposal.....45

E

Environmental protection.....17

G

Grease.....27

Grease gun.....27

I

Installation.....
- Clamping head.....38
- Hydraulic stationary chuck SPANNTOP 35
- HYDROK.....35
- HYDROK 32 RD / HYDROK 40 SE...37
- Preparations.....34

Intended use.....10

M

Maintenance schedule.....49

Multiple clamping pallet.....29

O

Operating conditions.....20

Overview.....24

Overview.....
- HYDROK.....21
- HYDROK 32 RD / HYDROK 40 SE...22

P

Packaging.....32

Personal protective equipment.....
- Hard hat.....12
- Protective gloves.....12
- Protective goggles.....12
- Protective work clothing.....11
- Safety footwear.....11

Personnel requirements.....9

Power specifications.....20

Preservation.....48

R

Representatives.....
- America.....59
- Europe.....56
- Germany.....55

S

Scope of delivery.....8

Spare parts.....8

Special dangers.....12

Storing.....33

Structure.....21

Subsequent storage.....41

Symbols on the packaging.....30

T

Tandem cylinder.....28

Transport inspection.....30

Transport, inner company.....31
Trouble shooting.....51
Trouble shooting table.....52
Type designation.....20
U
Unpacking.....31

HAINBUCH SPANNENDE TECHNIK

HAINBUCH GMBH
SPANNENDE TECHNIK
PO Box 1262 · DE-71667 Marbach
Erdmannhäuser Straße 57 · DE-71672 Marbach
Phone +49 [0]7144. 907-0
Fax +49 [0]7144. 18826
sales@hainbuch.de
www.hainbuch.com
24h-Emergency call +49 [0]7144. 907-444

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